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December 7, 1957

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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Electricity From Heat

See Page 357

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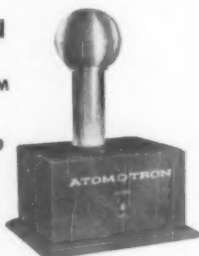
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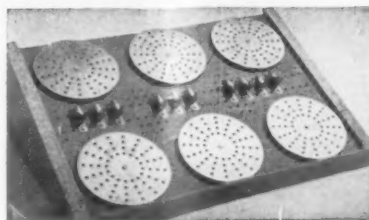


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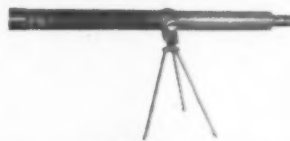
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EDUCATION

Need Education Reforms

National standards for scholastic competence are suggested as part of reforms necessary if the United States is to compete with Russia and Europe.

► A COMPLETE overhaul of education in the United States to make it qualitatively competitive with Russia and Europe was urged by Rear Adm. H. G. Rickover, chief of the Atomic Energy Commission's Naval Reactor Branch and assistant chief of the Navy's Bureau of Ships.

In a powerful indictment of the present educational system from grade school through college and graduate training, Adm. Rickover called for quality, not quantity, of graduates.

Launching of Soviet satellites, he told a conference on scientific education sponsored by the Thomas Alva Edison Foundation, Inc., meeting in Detroit, was "triumph of Russian education." The propaganda victory thus won by the U.S.S.R. should spark "drastic and long overdue reforms in utilizing the nation's intellectual capacities."

As Pearl Harbor showed that the U. S. could perform industrial miracles in a national emergency, so the Soviet's sputniks show the need for "educational miracles."

The successful Russian satellite program illustrates important facts. A modern totali-

tarian state can raise a limited sector of its economy to as high a standard as any country in the world. It can also devise an educational system shaped to the interests of the state and at the same time, induce all students to stretch their intellectual capacities to the utmost.

At present, Adm. Rickover charged, few American students at the age of 21 or 22 know as much after a four-year college course as most European secondary school graduates know at 18 or 19.

To remedy this, he urged establishment of uniform educational standards throughout the country. Since education is within the province of the states under our constitution, he suggested a private agency financed by all institutions of higher learning be set up to establish the standards.

National standards for the high school diploma, as well as for the scholastic competence of teachers, would be set by this agency. In this way, parents and local groups could tell whether or not schools were giving them a good return for their tax dollar.

Adm. Rickover also called for shortening the "general education" system to 14 years at most, and 12 to 13 years for brilliant children.

He said the Russians have built in record time an educational system that produces the trained professionals and technologists needed to achieve technological supremacy "day after tomorrow." The U. S. must be awakened to the dangers of its present educational system, and the prestige and material reward of professionals must be raised before this country can produce scientifically trained manpower competitive with the Russians.

"The rate of progress or decline of a country is so closely tied to the education" of its children that this rate depends on education, Adm. Rickover concluded.

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ASTRONOMY

Record Number Of Sunspots Seen

► THE HIGHEST number of sunspots in recorded history has been seen on the sun's face during 1957, the National Bureau of Standards has reported.

Experts at the NBS station at Fort Belvoir, Va., are betting the outbreak of dark areas on the solar disk will continue to rise, putting the peak of the current sunspot cycle into November or December, 1957. (See SNL, Nov. 2, p. 275.)

Still little understood, sunspots appear dark only in contrast to the sun's visible surface, and vary greatly in size from giants as much as 50,000 miles in diameter to very small specks only 500 miles across.

As far as can be learned, sputnik observations are yielding no direct information on sunspots.

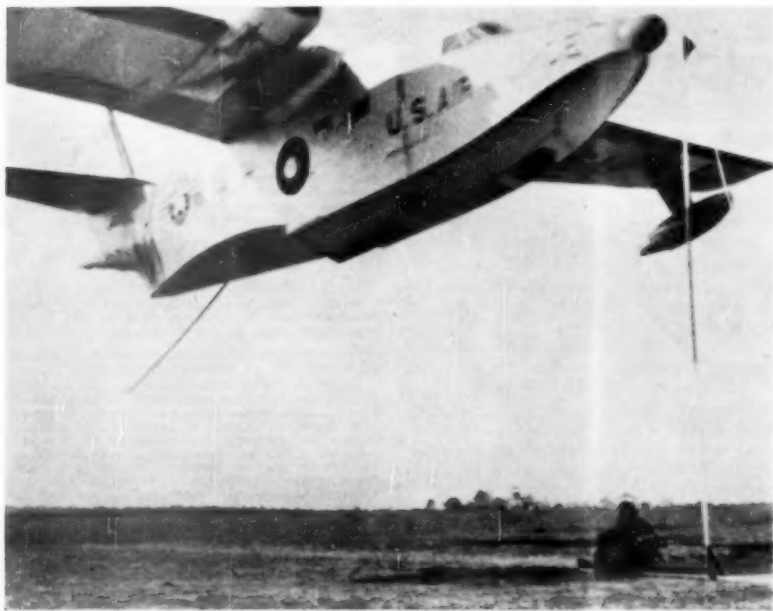
The first sunspot of the current cycle, which takes about 11 years for completion, was seen in August, 1953. It was then expected that the maximum would be reached sometime after July 1, 1957, and this factor determined to a large degree the choice of this date as the start of the 18-month International Geophysical Year, or IGY.

The provisional sunspot count for October was 269.2, up from September's 244.

The "smoothed" sunspot number, the running mean for the middle of a yearly period, shows the total was still rising and had reached 181.4.

One of the first results of studies preparatory to the IGY was finding an increase in the number of cosmic rays after one of these flares. Also found for the first time was a relation between ionospheric physics and cosmic rays. The ionosphere is the layer of earth's atmosphere, some 50 to 300 miles in height, that reflects radio waves, making possible long-distance communications.

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AIR RESCUE—A twin-engine Grumman amphibious aircraft, traveling more than 150 miles per hour at an altitude of 30 feet is shown as it snatches a man from the ground in a test of the rescue technique. The rescue kit, developed and designed by All American Engineering Co., Wilmington, Del., consists of a portable ground station and a winch, plus an engaging mechanism on the aircraft. A reel of nylon rope and a retractable arm with a hook retainer, which swings below the plane's tail, comprise the airborne unit.

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Dr. Martin Cummings, director of research service, Veterans Administration, will discuss "Mass Research in Medicine."

PHYSIOLOGY

Cold Baths Cut Colds

► RUSSIAN CHILDREN, six and seven years old, have been toughened up with cold water baths.

The scientist who experimented with the "hardening" process for pre-school children (Russian children begin regular school at age seven), recommends its general use throughout the Soviet Union at any time of year under any circumstances. The only factor that should be considered, O. T. Tarasova of the department of school hygiene at the V. I. Lenin Pedagogic Institute in Moscow says, is the particular type of higher nervous activity of each individual child.

In the experiments, 110 children, six to seven years old, in three kindergartens in Moscow received the cold water baths. Sixty other children did not and served as controls.

The children under observation were subjected to daily bathing up to their waists in water that was 91.4 degrees Fahrenheit at first and then gradually lowered to 57.2 degrees Fahrenheit. The experiment lasted for three and one-half months.

The children's reaction to the "hardening" was measured by taking their temperature under both naked and covered skin conditions; pulse; blood pressure; blood picture; and by studying the reduction of the frequency of colds.

From the study, the Soviet scientist concludes that:

1. The response to the cold baths depended not only on the water temperature and the duration of its application, but also on the particular type of higher nervous activity of the child.

2. Adaptability, conditioned reflex action and functional changes which the children exhibited differed according to whether the children belonged to the robust, even-tempered type; or to the robust, excitable type; or to the weak type.

3. Increased bodily resistance of the children was noted as a result of daily bathing; the frequency of colds was markedly reduced and in cases of chill the illness ran a smooth and short course without complications.

The author recommends the application of cold water baths in children of pre-school age at any time of year and under any conditions, with attention paid to the particular type of higher nervous activity of each individual child.

The Soviet method for hardening its youngsters is reported in the *Abstracts of Soviet Medicine* (Vol. 1, No. 2, 1957, Part B) published by the Excerpta Medica Foundation in Amsterdam, The Netherlands.

Science News Letter, December 7, 1957

phagocytin, Dr. James G. Hirsch, Rockefeller Institute for Medical Research, reported.

This substance is found in the specialized cells possessed by all higher forms of life and known as phagocytes.

Phagocytes, Dr. Hirsch told the National Academy of Sciences meeting in New York, move freely about the body and can ingest foreign matter from their surroundings.

Besides the phagocytes, both an acid environment and the protein lysozyme are known to kill bacterial invasions. Extremely small amounts of phagocytin are enough to kill promptly the various types of microbes that are usually found in the intestinal tract.

Scientists at the Institute are now working on purifying phagocytin.

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MEDICINE

Carcinogen Helps Cure

► A WOMAN dying of advanced breast cancer has been dramatically helped by injections of a chemical used in the past to cause cancer, rather than cure it.

The cancer-causing chemical, 3-methylcholanthrene or MC, was injected into six women, all in the advanced stages of breast cancer, by Drs. Charles Huggins and Jack D. McCarthy, University of Chicago, as a "last ditch" attempt to halt the rapidly spreading disease.

The treatment was most successful in one woman who had previously undergone several surgical operations for cancer and at the time of the MC injections was breathing only with great difficulty because the cancer had spread to her lungs.

After more than a month of daily injections, cancerous lumps on the skin began shrinking and her lungs cleared. Six months later the cancer appeared to be gone completely and the woman was back home doing her housework.

Results were not so dramatic in the other five cases, although in four of them the cancers were arrested temporarily and cancer colonies in the lymph nodes, skin, bone, lungs and brain shrank up. Two of the original six have died.

The effect of the MC injections is a medical paradox. The chemical is universally used to induce cancers in laboratory animals but some scientists have found that it, and other related chemicals, sometimes

slows down or stops certain transplanted growths in animals.

X-rays are another example of this medical mystery. Although they frequently cure cancer in humans, they are powerful causers of cancer when given in excessive amounts.

In the six human cases, the MC caused a lowering of hemoglobin and blood proteins as well as a temporary anemia, but these conditions improved at the end of treatment.

None of the patients developed new cancers, a hopeful sign that the chemical, in the dosages used, may not cause cancer in humans. However, the scientists continue to regard it as a potentially dangerous drug which should be used only in certain cancer patients when all other measures have failed.

They published their findings in *Cancer Research* (Nov.).

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BIOCHEMISTRY

Identify Chemicals in Blood That Kill Germs

► HOW THE body's white blood cells fight off invasions by disease bacteria is being probed by identifying the chemicals that give the cells their ability to kill.

One recently discovered substance that destroys intestinal bacteria is known as

TECHNOLOGY

Make Energy Converter

A device called a thermionic converter has been developed that is capable of converting heat energy directly into electrical energy without the use of thermocouples.

See Front Cover

► AN ELECTRONIC device that converts heat energy directly into electrical energy has been developed by the General Electric Company, Dr. Guy Suits, vice president and director of research, has reported.

The device, a thermionic converter, "boils" electrons out of a hot metal surface to produce an electrical current. Experimental converters have changed more than eight percent of the applied heat energy into electrical power.

The photograph on the cover of this week's SCIENCE NEWS LETTER shows Dr. Volney C. Wilson of the company's research laboratory, Schenectady, N.Y., inventor of the new thermionic converters. There are many versions of these experimental devices.

The converter represents a unique combination of several principles long known to scientists.

In explaining his invention, Dr. Wilson compared the boiling of electrons out of a metal surface with lifting water to the top of a hill.

"If we let the water flow down the hill, it can do work—run a water wheel for instance—but only if we can provide a smooth, uninterrupted path down the hill. The thermionic converter essentially smooths the path of the electrons from a hot electrode to a cooler one and removes barriers which in the past have absorbed

the energy before it could do useful work in an electric circuit."

Most methods of converting heat into electricity involve moving machinery, such as steam plant electrical generation or the heat of gasoline combustion expanding gases, to operate a gasoline engine generator.

Most previous methods of converting heat directly into electricity without intervening rotating machinery have been based on thermocouples. In such devices a junction between two different metals is heated and small electrical currents are produced. However, thermocouple efficiency is normally well below one percent.

General Electric officials emphasized that thermionic converters are "experimental laboratory devices only" and are not ready for production.

"Dr. Wilson's new thermionic converter is an extremely important scientific contribution," Dr. Suits said, "but neither he nor we want to imply that solar-powered space ships or inexpensive atomic power plants are just around the corner because of this invention."

The research director added: "It is only natural to try to relate every new basic scientific discovery to some futuristic gadget. However, real research just doesn't ordinarily work that way."

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space station very slowly, since its acceleration is quite low. After two hours it would not be more than 20 miles away.

The electric propelling system would work for the entire trip, which would take 402 days, accelerating the ship about half the time and decelerating it during the other half.

This continuous operation, Dr. Stuhlinger's studies show, make guidance of the space ship easy. During the spiraling departure from the space station and approach to an orbit around Mars, the ship's power can be cut out if a time delay is needed. If the ship should be late in meeting Mars, the crew can gain time during the spiraling phase by opening the throttle a little more.

The ship's position will be automatically measured and computed by star tracking, so that any necessary corrective measures can be taken immediately.

Dr. Stuhlinger estimates the chance of a crew member being hit by a meteor is very low, about the same as that of a man's losing his life on earth in an accident.

Crew members will have more comfort and more space in which to move around than persons on today's submarines. However, to take care of any possible interplanetary mishap, Dr. Stuhlinger recommends sending about ten ships traveling together on one expedition.

He does not estimate the cost of such a venture but points out that the earth to space station part of the journey would be the most expensive. For every pound of payload taken into the space station orbit, 160 pounds of take-off weight must be invested in the commuter rockets.

His design data for one ship call for a total initial mass of 730 tons.

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AERONAUTICS

Space Ship Described

► THE FIRST SPACE ship to Mars will be driven by electricity, not chemical rockets, one of the top guided missile experts in the country has predicted.

Dr. Ernst Stuhlinger, director of the research projects office in the Army Ballistic Missile Agency, Huntsville, Ala., has found that an electrically propelled space ship would be much lighter than a ship using chemicals for power. It would start on its Martian journey from an earth-circling space platform.

The ship's primary power source, he reports in the *Scientific Monthly* (Dec.) would be a nuclear reactor containing about 12 tons of uranium. For protection from its deadly radiation, the reactor would be at least 250 feet from the space ship crew's living quarters. It would drive a turbo-generator.

Dr. Stuhlinger's proposed design shows a giant wheel at one end of a long shaft, with the reactor at the other end. Living quarters are in the giant wheel. As soon as the turbine and generator start to turn, the

entire ship revolves slowly in the opposite direction, thus giving the crew a little "gravity" as simulated by the centrifugal force.

The flight path between the earth and Mars would be far different in an electrically powered ship than in a rocket driven one.

The Martian trip would have to be made in six stages: from earth to the space platform from which the interplanetary ship would be launched; the long path from there to an orbit circling Mars; a descent in a winged landing craft to the planet's surface, and these three steps in reverse for the return trip.

Crew members would be gone two and a half to three years, Dr. Stuhlinger calculates. They would reach the space station some 1,000 miles above the earth's surface in large, three-stage rockets. The winged nose section of these rockets, really a fourth stage, would be used for the return trip to earth.

The interplanetary ship would leave the



SELENIUM GLASS—A glass-like material that transmits infrared radiation to 25 microns has been developed by the Eastman Kodak Company, Rochester, N. Y. It is said to be useful in missile guidance, fire control and other infrared optical systems.

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PUBLIC HEALTH

Quacks Cause Deaths

► COUNTLESS cancer victims died needlessly last year because they accepted such quack remedies as "a diet of pure grape juice or sitting in a zinc-lined box and accumulating 'orgones'."

This was made public in a report on cancer quackery by the American Cancer Society, presented at the Society's annual meeting in New York.

Biggest reason for leaving a reputable physician and going to a quack, or seeing both of them at the same time, is fear, the report states.

The quack victims are afraid their cancer is incurable, or they are afraid of the expense and think a quack is cheaper.

Some fear surgery or radiation and prefer painless "miracles," others think cancer is a social disgrace, or they think their own doctor has given up hope for them.

Thousands of cancer quacks are now operating in the U. S. and the American Cancer Society offered these ways to spot them.

Their treatments are usually secret or available only from themselves.

They use advertising and planted "testimonials" to support their cure claims, rather than reports in current, reputable scientific journals.

Often they use the name of a high-sound-

ing research organization. They claim the "medical trust" is against them and refuse consultation, and their medical records are either scanty or nonexistent.

However, spotting the cancer quack is not always easy, since charlatans are found both inside and outside the medical profession.

At one end of the quack line are medical doctors who are simply misguided or uninformed on cancer treatment. On the other end are the ghouls who operate assembly line clinics, using methods they know to be useless and charging exorbitant fees. Some of these quacks are making more than \$1,000,000 a year with their dangerous treatments.

Unfortunately, the only way finally to get rid of the cancer quacks is to find a way to cure cancer, the Society said.

The only hope is to legislate and educate against quackery as much as possible until a legitimate cure for cancer can be found. Until then, the public's main protection from the quacks is in the investigation of claims of new remedies, laws to prevent false claims from duping the public, and better education of the public and the medical profession.

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GEOPHYSICS

Sputnik Facts Collected

► A SUMMARY of reports concerning the first Russian sputnik, its rocket and nose cone, was issued by the U. S. National Committee for the International Geophysical Year, or IGY, the official group guiding U.S. participation in IGY.

In the current *IGY Bulletin* (Nov.), the committee reports that the first Soviet satellite was launched on Oct. 4, 1957, with a speed of about 26,000 feet per second at an angle of 65 degrees to the equator.

Scientists estimate sputnik I was sent into its earth-circling orbit from a point north of the Caspian Sea. An "extremely accurate and effective system of automatic controls" was reported designed for the launching rocket.

The satellite itself is a polished sphere nearly 23 inches in diameter and weighing more than 183 pounds. Its four radio antennas, which measure from seven feet, ten and a half inches to nine and a half feet, were folded back, then sprung into position upon ejection.

The satellite's visibility was comparable to stars of the fourth to ninth magnitude. It contained nitrogen for cooling purposes.

It also contained two transmitters, one operating at 20.005 megacycles, the other at 40.002 megacycles. The pulse of each signal was three-tenths of a second, followed by a pause of similar length during which the other signal was transmitted.

Power was one watt, and the signals were modulated with telemetered data, including information on atmospheric temperature and density.

The first U.S. radio reception of the satellite's signals was reported by RCA Communications, Inc., at Riverhead, Long Island, at 8:07 p.m., EDT, on the launching day Oct. 4. Signals were later picked up by Minitrack stations, converted from the recommended frequency of 108 megacycles, by Antarctic IGY stations, by receivers on a drifting ice floe, and by thousands of amateurs around the world.

The radio broadcasts stopped on Oct. 25, the power supply being exhausted.

Visual observations were more difficult, and most sightings were of the satellite's carrier rocket, not the satellite itself.

The Smithsonian Astrophysical Observatory calculated that on Oct. 11 the rocket's path took it as far as 583 miles and as close as 143 miles to the earth's surface. The eccentricity, or variation from a true circle, of the orbit was five-hundredths, and precession amounted to a little more than three degrees daily. Time for a complete circuit was set at 96.03 minutes.

Science News Letter, December 7, 1957

A 40-foot-long shock tube to test ballistic missile designs produces shock waves which travel 17 times the speed of sound.

MEDICINE

Radiation Effects Vary

► THE SUCCESS of radiation treatment for cancer may depend on exactly what stage of growth the cancer cells are in at the moment the radiation hits them.

This was reported by Dr. William R. Eyler, Detroit, Mich., to the Radiological Society of North America meeting in Chicago.

Experiments with mice appear to bear out the earlier theory that cancer cells are much more affected by radiation if they are in the process of cell division, or mitosis, he reported.

This theory was explored by two English doctors who took biopsies of skin cancers before each treatment and only gave radiation doses at the times they found the cells in the process of dividing.

If the cells were not dividing, but lying dormant, the radiation treatment was postponed. In this way they obtained good results with lower doses than they had used with daily treatments.

The same theory was used on the mice, although instead of taking biopsies each time, Dr. Eyler used different radiation treatment intervals for different groups of mice.

Admitting the research had little clinical application at the present time, Dr. Eyler did advance certain cautious suggestions.

He concluded that the response to radiation can depend not only on the total doses and overall time of the radiation, but also on the number of individual radiation treatments in a given amount of time.

A complete description of radiation treatment should contain information on all three points.

Watch Drugs' Action

► MONKEYS with windows in their heads are being used to study the effects of anticoagulant drugs, Dr. John S. Meyer, Boston, Mass., reported to the meeting.

The small windows have allowed scientists to watch anticoagulant or "blood thinning" drugs in the brain and to study how they help ward off the stoppages of circulation that cause strokes and brain disease.

Long-term use of anticoagulants in persons with hardening of the arteries is becoming more and more common. The drugs are able to prevent blood stoppages in vessels that have become narrow and constricted and in this way prevent attacks from happening, Dr. Meyer reported.

But how the drugs help once an artery has been blocked, has not been completely understood. The original theory was that anticoagulant treatment could "re-canal" the blocked vessel, that is, form a new channel for blood to flow through.

Another possibility is that the drugs in some way improve the collateral circulation supplied by tiny new artery connections that link the two sides of the artery that has been blocked.

This theory was borne out by the monkey

experiments in which drugs and dyes were introduced into the circulation and watched as the dyes tinted the blood and body fluid.

Rather than re-canalizing the blocked vessel, the anticoagulants prevent stickiness of red cells, white cells and platelets in the blood, Dr. Meyer reported.

In this way they prevent increasing resistance to blood flow and improve the collateral circulation.

Science News Letter, December 7, 1957

MEDICINE

Drive Opens Against Childhood Killer

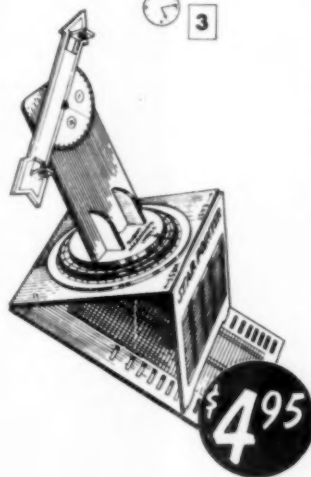
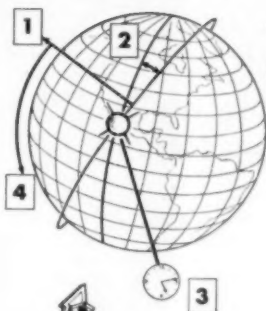
► MORE THAN 50,000 supermarkets have become headquarters for a nationwide campaign against muscular dystrophy (MD), the childhood disease that attacks muscles and always kills.

What causes MD is not now known, although research indicates that the muscular deterioration may come from the inability of the muscles to use some needed form of vitamin E.

Science News Letter, December 7, 1957

HERE'S HOW TO PREDICT EARTH SATELLITE ORBITS!

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PSYCHOLOGY

"Picture" of Learning Drawn by Brain Waves

► ELECTRICAL impulses from the brain waves, for the first time, have drawn a "picture" of the learning process.

Thus an animal's moves are "telegraphed" so that scientists can predict his learned responses.

These developments in scientific "mind reading" have occurred in brain experiments reported by Drs. Keith Killam and E. Roy John of the University of California at Los Angeles School of Medicine, at the Baltimore meeting of the Society for Pharmacology and Experimental Therapeutics.

Cats were taught by a warning signal, either a flashing light or a clicker, to move so as to avoid an electric shock.

This learning was accompanied by changes in brain waves emanating from certain brain areas. The waves were carried through permanent electrodes in the cat's head and recorded by an EEG machine. A characteristic wave pattern preceded certain of the cat's moves.

Tranquilizers administered to the animals made them forget what they had learned about the light-clicker-shock relationship. Tranquilizers also erased the "trained" patterns of brain waves. They were replaced by patterns characteristic of untrained cats.

As these drug effects wore off the cats again remembered what they had learned about the warning signal. "Trained" electrical patterns also reappeared on the EEG recordings.

The UCLA investigators suggested that these "trained" patterns may be memory correlates, not previously demonstrated in EEG experiments.

Science News Letter, December 7, 1957

ENGINEERING

Castor Oil in Dash Boards Makes Car Driving Safer

► CASTOR OIL in the crash panel of your automobile will make driving safer and still preserve the car's interior beauty.

Castor oil as a softening agent is the key to a new foam plastic described as "outstanding" crash padding before a meeting of the American Chemical Society in New York.

Most plastic foams tried as automobile crash padding have sacrificed maximum safety for better appearance. Scientists have found the best impact shock absorbers to be completely crushable materials with no elasticity or rebound, such as very thick honeycombs of paper or blocks of polystyrene, the light-weight Christmas ornament plastic foam. However, such pads usually are too thick for use on an automobile instrument panel, and would soon be covered by unsightly dents from everyday knocks and bumps.

Thinner flexible pads that do not dent permanently, such as foam rubber, simply do not absorb impact shock.

Drs. M. E. Bailey, A. Khawam and G. C. Toone, and J. W. Hull, National Aniline

Division, Allied Chemical and Dye Corporation, Buffalo, N.Y., reported a successful compromise in the form of a castor oil-softened diisocyanate plastic foam. The padding has enough stiffness to absorb fully nearly all instrument panel bumps encountered in most auto accidents. However, the scientists reported, enough flexibility is built into the new foam to allow it to return quickly to its normal shape after being dented.

Besides making possible superior crash padding, the new castor oil-diisocyanate formulations can also be used as adhesives with higher bonding strength than any other known material, or as protective coatings with outstanding resistance to the action of chemicals and abrasives, Dr. Bailey said.

Urethan, an isocyanate blown into a multi-celled foam by gases released when the ingredients react, is used in some present auto crash pads. The properties of the new castor-oil softened derivative surpass those of urethan and are far superior to those of other plastics, the scientists reported.

Science News Letter, December 7, 1957

BIOLOGY

Rapeseed Oil Used To Lower Fertility

► AN OIL taken from rapeseed lowers fertility in rats and may be useful as a new method of birth control for humans.

This is reported by Drs. K. K. Carroll and R. L. Noble of the University of Western Ontario, London, Canada, who studied the effects of feeding erucic acid to rats.

Erucic acid is a fatty acid found abundantly in rapeseed and related oils. It was given to both male and female rats and progressively reduced the fertility of the males until they became completely sterile, although still healthy, five months after starting the special diet.

In the female rats, the erucic acid did not appear to affect fertility and pregnancy, although few of the offspring survived for long because of poor milk production by the mothers.

Erucic acid may interfere with reproduction by interfering with the way the body normally uses the essential fatty acids in the diet, the researchers reported.

In the male rats, the erucic acid decreased the number of sperm cells produced. If the diet was not kept up too long, however, sperm-producing ability returned when the acid was no longer continued in the animals' food.

"The reduction in fertility as observed in the male rat, if reproducible in other species, may have significance for the control of fertility in the human," the scientists report in the *Canadian Journal of Biochemistry and Physiology* (Nov.).

Erucic acid is readily available and palatable in the diet, it is easily broken down by body chemistry and it produces no side effects.

Further studies of it are now going on in other species of animals.

Science News Letter, December 7, 1957

IN SCIENCE

MEDICINE

Effects of Brain Strokes Unknown for Weeks

► The full effects of a brain "stroke" such as President Eisenhower has had, are not often apparent for several weeks. Such occurrences are known medically as "cerebral vascular accidents."

Often they are fatal, but when they do not involve an actual hemorrhage in the brain, the chances for complete recovery are good.

How permanent such symptoms as speech impairments will be cannot be predicted immediately after the attack, because they may be due to either actual destruction of brain tissue, or merely to a temporary interruption of normal function due to swelling and other factors.

In the President's case the middle cerebral artery was involved, and a small branch of it became occluded by either a blood clot or a vascular spasm. When the vessel is small, most patients survive this type of attack unless complicating factors are present.

Hardening of the arteries and high blood pressure are the most frequent cause of such accidents. The small vessels lose their elasticity, become narrowed and cause the blood flow to stop.

There are usually no signs of an impending attack and most of the time it strikes quickly.

Science News Letter, December 7, 1957

ENDOCRINOLOGY

Long Use of Reserpine Changes Rat's Sex Gland

► CONTINUED use of reserpine results in abnormal changes in the sex gland cells that produce the hormone androgen in rats, scientists at the University of Helsinki, Finland, report in the British journal, *Nature* (Nov. 23).

A prolonged trial of reserpine was made on the animals to determine what effects the tranquilizer had on endocrine glands when administered over a long period of time.

They found the only glands showing any significant changes after the trial period were the testes of the male animals. Although the production of sperm was normal, there was a decided reduction in the number of interstitial cells in the glands of treated rats.

The interstitial cells are necessary to produce the male hormone, androgen, which results in the development of the secondary sex characteristics such as growth in humans of the beard and body hair and other "masculinizing" features.

Reporting the work were O. Eranko, V. Hopsu, E. Kivalo and A. Telkka, of the University of Helsinki's anatomy department.

Science News Letter, December 7, 1957

THE FIELDS

GENERAL SCIENCE

Science Institutes To Benefit About 5,250

► A PROGRAM for improving the teaching of science and mathematics that predates Sputnik by five years will provide summer training for approximately 5,250 of the nation's high school and college teachers in 1958.

The National Science Foundation has reported that during the summer of 1958 it will award stipends and pay the tuition for 5,000 high school and 250 college teachers of science and mathematics to attend summer training at 108 institutes in 104 educational institutions.

Dr. Alan T. Waterman, the Foundation's director, announced awards of the grants totaling \$5,340,000 to support the summer institutes.

"The summer-institutes program of the Foundation," Dr. Waterman said, "is in step with current plans for strengthening the training of scientists in the United States."

"Good science teachers are apt to be the first to stimulate an interest in science among our young people in secondary schools. But if instruction is not stimulating, and contains outdated concepts, it tends to weaken youths' motivations toward science careers. Foundation-supported summer institutes provide opportunities for thousands of hard-pressed high school science teachers to learn at first hand the rapidly advancing developments in today's science, mathematics, and engineering."

The highly successful program for bringing teachers up-to-date in the sciences and mathematics was started experimentally in 1953. The grants, given to the institutes, cover tuition and fees and the participant receives a maximum of \$75 per week plus allowances for dependents and travel expenses.

Science News Letter, December 7, 1957

TECHNOLOGY

Flexible "Light Bulbs" Have Been Developed

► PLIABLE "light bulbs," made of nylon, other plastic or steel mesh, have been developed by Westinghouse scientists.

The flexible lamps, that can be shaped as desired, are seen as the forerunners of window shades, drapes and other bendable materials that actually produce light.

Called "Rayescent" lamps by Westinghouse, the flexible light producers are electroluminescent cells—sheets or panels of glass, metal or plastic coated with a phosphor and treated to conduct electricity. When supplied with power, they light up.

To produce the flexible electric lamps, Westinghouse scientists, who have been developing electroluminescent panels for wall and ceiling lighting and recently reported

the possibility of windows that can be "turned on," now have found a method to apply phosphors to nylon, plastics and steel mesh. (See SNL, Nov. 9, p. 296.)

Although the flexible lamps will not be at the local store for several years, E. G. F. Arnott, director of research for the Westinghouse lamp division, predicted the lamps could be useful in the home, theater and for special effects in restaurants and stores. He also foresees their use in the form of illuminated tapes for the military.

The flexible lighting, which can be made in various colors and whose light intensity can be increased or decreased as desired, might be available for use in airplane instrument panels within two years.

Science News Letter, December 7, 1957

TECHNOLOGY

Show Chemical Memory For Computing Machines

► MILLIONS of microscopic cells containing photosensitive liquid may provide the first practical chemical memory for computing machines.

A laboratory demonstration of a large-scale prototype that prints, reads and erases information on the photosensitive film was demonstrated at the dedication of the engineering and research center of the National Cash Register Company, Dayton, Ohio.

The technique of encapsulation forming "solid liquids" by composing droplets of liquid a millionth of an inch in diameter in gelatin film and then coating them on paper or other substances was described by Stanley C. Allyn, chairman of the board.

The company's scientists, during 12 years of research, have developed new oils or dyes called metachromatic dyes. When a blue light shines on them, they turn a brilliant blue. When a yellow light shines on them, they become colorless again. This chemical switch can be made and erased indefinitely.

By putting these dyes in a capsule of microscopic size, containing millions of droplets per square inch, they can be handled like solids and used for computing machine memories.

Similar to magnetic tapes, now being used, the chemical memories have the advantage of eliminating spreading. They also promise computers with high storage capacity, high access speed and low cost. Ideally, 1,000,000 bits of information could be stored on a square inch.

The same technique has provided National Cash Register Company scientists with a commercial carbonless business form. As the key of a typewriter strikes the paper coated with these tiny droplets, the cells break, leaving a print.

The same techniques may provide a means of printing, with magnetic characters that can be read by both people and machines, and will be used in pharmaceutical practice for keeping reactive compounds separate in tiny droplets.

The company hopes to have a working model of its chemical memory computer in a year and one-half, Mr. Allyn said.

Science News Letter, December 7, 1957

ENDOCRINOLOGY

Weight Loss Produced By Hormone Injection

► A LOSS of weight, even without reducing the number of calories eaten, can be produced by injections of a pancreatic hormone in rats.

This was reported by Drs. I. W. F. Davidson, J. M. Salter and C. H. Best, University of Toronto, Canada, in *Nature* (Nov. 23).

The hormone tested was glucagon, a protein secreted by the pancreas and believed to play some role in the production of diabetes. Animals receiving injections of it gained less weight and contained much less fat, protein and water than control animals who ate the same number of calories.

The effects of the hormone indicated that it speeded up the metabolic rate of the animals, so studies were made of the amount of oxygen consumed by the animals.

It was found that the metabolic rate jumped about 35% and oxygen consumption was at its greatest one hour after the injection.

"A stimulating effect of glucagon on the metabolic rate has not been noted previously," the scientists report.

How and why the hormone has this effect is not understood, although it was found that animals who had had their adrenal glands removed were not affected by the injections.

This, the scientists conclude, points to the possibility that adrenal hormones are involved in the metabolic rate change and should be carefully studied.

Science News Letter, December 7, 1957

OCEANOGRAPHY

Chemical Study Measures Rise in Ocean Floor

► SCIENTISTS in Bombay have developed a chemical process for measuring the rate at which the floor of the Pacific Ocean is building up.

Chemical extraction of a radioactive isotope of beryllium from a 49-foot core drilled from the floor of the Pacific indicates dirt, sand, dead marine life and other sediment are building up new floor at a rate of about 18 hundredths (0.18) of an inch every 1,000 years.

The work, reported in *Deep-Sea Research* (Vol. 4, 1957), is based on the known decrease in activity of the long lived beryllium-10 isotope, with a half-life of 2,700,000 years. The isotope, produced by cosmic ray action, is believed to have been precipitated for millions of years with rain water. The scientists assumed the precipitation to have been unvarying, and assumed the core under study represented sediment that had been undisturbed for millions of years.

Chemical extraction of the isotope selected at measured depths on the core gave samples of the radioactive isotope from which it was possible to determine the age of the sediment at a particular depth.

Science News Letter, December 7, 1957

TECHNOLOGY

Atomic Reactors for Power

The United States is entering the atomic power age. The nation's first full-scale atomic power station for generating electricity is scheduled to go into operation soon.

By HOWARD SIMONS

► PITTSBURGH, the nation's great steel city, is about to become the nation's great atomic electricity. Shortly, the world's first full-scale atomic power station devoted solely to civilian needs, the Shippingport Atomic Electric Generating Station, will go into operation.

When this happens, a new power age in the United States will be ushered in. For Shippingport will mark this country's first large atomic power plant designed to produce electricity to be used by the industries and home consumers of the Pittsburgh area. Other such atom-produced electricity has been used experimentally to light homes and buildings, notably in Arco, Idaho, West Milton, N. Y., Moorspark, Calif., and Vallecitos, Calif., but not one is on the grand scale promised by this giant station.

If all goes well, Shippingport will begin with a capacity of 60,000 kilowatts of electricity and then build up to a capacity of 100,000 kilowatts.

The Shippingport reactor is known as a PWR or pressurized water reactor. It is designed so that an atomic core, or charge of fuel, in which the fission process takes place, will heat high-pressure water. This will be used to convert a second supply of water into steam. The resulting steam, in the same manner as the coal-fired electric generating station, will produce the electricity.

In the making since Sept. 6, 1954, the Shippingport plant is a joint project of the Atomic Energy Commission and the Duquesne Light Company of Pittsburgh. Westinghouse Electric Corporation, under contract to the AEC, designed and developed the nuclear reactor.

A-Power Controversy

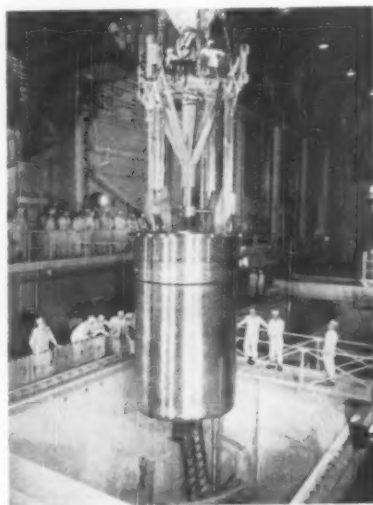
In addition to ushering in atomic power, the Shippingport station also puts under full steam the AEC's much-criticized and much-defended atomic power program. This is a program which for some time now has been caught in several cross-fires. These have been between Democrats and Republicans, between public power and private power, between the Joint Congressional Committee on Atomic Energy and the AEC, and between those critics who see us falling behind the United Kingdom and Russia in developing atomic power and those who see us leading the world.

The crux of these fights, upon which millions of dollars have been bet by both Government and industry, can perhaps best be summed up by two groups of the antagonists themselves.

In July, 1957, the Joint Congressional Committee had this to say of the AEC reactor program: "The Joint Committee over the years has not been satisfied that the AEC has been making sufficient progress in the development of prototype power reactors to test and demonstrate the practical problems of achieving economic nuclear power."

On Nov. 14, 1957, Chairman Lewis L. Strauss of the AEC and chief defender of his agency's reactor program said:

"At the present stage of the nuclear art, experiments on advanced reactors on the scale of 12 inches to the foot—that is to say, full-scale experiments—are not warranted. First must come study and research, followed by experimental plants such as this one [the Sodium Reactor Experiment at Santa Susana, Calif., the first non-military nuclear reactor, designed and built exclusively for civilian use, to produce electric power for distribution on a commercial basis by the Southern California Edison Co., and built by Atomics International] and following that, the building of 'first gen-



REACTOR'S HEART—This 58-ton nuclear core is being lowered into position in the nation's first full-scale atomic power plant at Shippingport, Pa. When this giant electrical generating station, a product of the Atomic Energy Commission, Westinghouse Electric Corporation and the Duquesne Light Company, goes into operation, the U. S. will come of age in the atomic power era.

eration' prototype or demonstration plants of commercial size."

Part of the controversy can be traced to the relative status of this nation, as compared to either the United Kingdom or Russia, in the generation of power from "fossil fuels," such as coal and oil. The U. S. is considered a power-rich nation and present estimates show that we can still produce power as cheaply, if not more cheaply, by using conventional methods. Both the United Kingdom and Russia are power-starved and, by necessity, must turn to new sources, such as atomic and solar energy.

The "Numbers Game"

Chairman Strauss maintains that "thus far we have resisted pressures to establish arbitrary goals of installed kilowatts for a set date, since we are not entered in any numbers game with anyone." However, he did report that by the mid-1960's there are expected to be some 18 or 20 nuclear power plants serving homes and industries across the nation.

Another AEC official, W. Kenneth Davis, director of reactor development, did enter a "numbers game," however, and predicted that by 1960 we would have 2,000,000 kilowatts in atomic power plants in operation. In contrast, the Joint Congressional Committee has charged that, according to their information, the figure will be less than 700,000 kilowatts.

The United Kingdom and Russia, on the other hand, have been in the "numbers game" for some time. The British hope to have from 5,000,000 to 6,000,000 kilowatts of atomic electricity by 1965. The Russians have announced plans to have 2,000,000 to 2,500,000 nuclear electrical kilowatts of capacity in operation by 1960.

Whether either England or Russia will reach these goals is not known, although it is known that both are trying very hard. Some doubt about the Russian effort was cast by Mr. Davis recently. He charged that the Soviet program strangely enough was beginning to look more and more like ours.

"The proposed Russian pressurized water reactor," he said, "is very interesting. Its design is remarkably similar to that of our Shippingport PWR in about every respect. . . ."

The best estimates for the number of nuclear reactors built, building or planned in the U. S. as of a year ago put the grand total at 345, of which 131 are low-temperature or not useful for power generation and the remaining 214 are high-temperature, power-producing reactors. This grand total includes both research and test reactors, as well as full-scale civilian power reactors for installation in foreign countries.

These reactors can be very big, like the Shippingport plant, or very small, like the Army Package Power Reactor currently in operation at Fort Belvoir, Va.

They can be designed to produce electricity for homes and businesses, again like Shippingport, or to test the effect of nuclear radiation on materials, such as the recently completed Engineering Test Reactor at Idaho Falls, Idaho.

They can be used to drive submarines like the pressurized water type in the Nautilus or teach students the workings of atoms.

But regardless of the type, size or purpose, when the Shippingport reactor goes critical, the United States will have come of atomic power age. If this time comes before year's end, when it is expected, it will be on the 15th anniversary of the first reactor in the world—Chicago Pile 1, started up in December, 1942.

Science News Letter, December 7, 1957

BIOLOGY

Tests Show Alcoholism May Be Due to Heredity

► BLOOD chemistry and urine tests have shown that alcoholism may be due to hereditary factors.

A group of Texas scientists told the National Academy of Sciences meeting in New York that they studied a group of male alcoholics and compared their biochemistry to that of a normal group who drank only in moderation.

Among the things compared were the total number of white blood cells, the amount of sodium, potassium and calcium in the blood, blood sugar, and the chemical composition of urine.

In all these characteristics, the alcoholics showed significant differences from the normals.

"While the evidence is far from complete, there is a strong presumption that a number of these items are under genetic control," the scientists said.

If this is true, then the ground work has been laid for tests that could be used to spot youngsters who are likely to develop into alcoholics.

The scientists reporting the findings were Drs. Roger J. Williams, Richard B. Pelton, Herta-Maija Hakkinen and Lorene L. Rogers, The University of Texas, Austin.

Science News Letter, December 7, 1957

AGRICULTURE

Aphid-Resistant Alfalfa Developed by U.S.D.A.

► A NEW VARIETY of alfalfa, highly resistant to the spotted alfalfa aphid, can soon be grown, the U. S. Department of Agriculture has announced.

Named Moapa, the alfalfa was developed from resistant plants selected from a variety that is susceptible to the aphid. Each year the insect causes millions of dollars in damage to alfalfa. The variety is described as a non-winter, hardy alfalfa and is suitable for planting where the "parent" alfalfa variety, African, is grown.

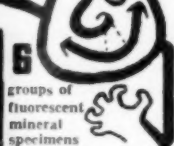
Scientists with the crops research division of USDA's Agricultural Research Service, USDA's entomology research division and the University of Nevada's agricultural experiment station developed the new plant.

Science News Letter, December 7, 1957

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Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

BIOCHEMICAL CYTOLOGY—Jean Brachet—*Academic*, 516 p., illus., \$8.80. Linking the two sciences, morphology and biochemistry, which have so much in common. This book is intended for advanced students and research workers.

CHEMISTRY OF ORGANIC COMPOUNDS—Carl R. Noller—*Saunders*, 2nd ed., 978 p., illus., \$9.00. In this new edition, old material has been revised and new material added.

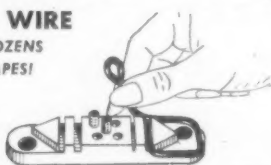
CIVIL AVIATION MEDICINE: Hearings—U.S. Senate Subcommittee, A. S. Mike Monroney, Chairman—*Committee on Interstate and Foreign Commerce*, 150 p., paper, free upon request from publisher, Senate Office Building, Washington 25, D.C.

DOCTOR AND PATIENT IN SOVIET RUSSIA—Mark G. Field with foreword by Paul Dudley White—*Harvard Univ. Press*, 266 p., \$5.00. A sociology of the medical profession in Russia, presenting an account of the state of medicine from the last days of the tsars through the various changes of Soviet rule to the end of 1956.

THE FISHES OF OHIO: With Illustrated Keys—Milton B. Trautman—*Ohio State Univ. Press* with Ohio Division of Wildlife, 683 p., illus., \$6.50. Ohio residents \$6.70. A comprehensive study for the fisherman and scientist.

FOREST FERTILIZATION: A Bibliography, with Abstracts, on the Use of Fertilizers and Soil Amendments in Forestry—compiled by Donald P. White and Albert L. Leaf, *State Univ. College of Forestry* (E. D. Crittendon), 303 p., \$3.00. World Forestry Series Bulletin Number Two.

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A HANDBOOK OF ANIMAL PHYSIOLOGY—E. M. Pantelouris—*Williams & Wilkins*, 255 p., illus., \$6.25. Intended to present a framework of main facts and an idea of the scope of the subject as an introduction to the study.

A HUNDRED YEARS OF EVOLUTION—G. S. Carter—*Macmillan*, 206 p., \$3.75. A summary account of the story of evolution during the last century.

THE IONOSPHERE: Its Significance for Geophysics and Radio Communications—Karl Rawer, translated from German by Ludwig Katz—*Frederick Ungar Pub.*, 202 p., illus., \$7.50. What we know about this important part of the upper atmosphere is largely based on the results of the electrical method of observation, but as a result of space flights we shall probably soon know much more.

LABORATORY GLASS-WORKING FOR SCIENTISTS—A. J. B. Robertson and others, with foreword by Sir Eric K. Rideal—*Academic*, 184 p., illus., \$4.00. To help the scientist to construct his own apparatus if necessary.

MIRACLE DRUGS AND THE NEW AGE OF MEDICINE—Fred Reinfeld—*Sterling*, 116 p., illus., \$3.95. In cases of influenza and pneumonia alone, modern drugs saved an estimated 1,100,000 American lives in the 15 years between 1938 and 1952.

MOTHER AND CHILD: A Primer of First Relationships—D. W. Winnicott—*Basic Books*, 210 p., \$3.50. A pediatrician and psychoanalyst tells the young mother how she can be happiest with her baby and how she can provide the baby with what he needs most.

1001 QUESTIONS ANSWERED ABOUT THE WEATHER—Frank H. Forrester—*Dodd*, 419 p., illus., \$6.00. Intended to answer your questions about the weather and how it is predicted.

THE PATH OF CARBON IN PHOTOSYNTHESIS—J. A. Bassham and M. Calvin—*Prentice-Hall*, 104 p., illus., \$3.00. One of the most intriguing problems facing scientists is discovery of the method by which the green leaf converts the sun's energy into human food.

PERSPECTIVES IN BIOLOGY AND MEDICINE, Vol. I, No. 1—D. J. Ingle and S. O. Waife, Eds.—*Univ. of Chicago Press*, 123 p., diagrams, quarterly, paper, \$6.00 per year. Intended to communicate new ideas and to stimulate original thought in the biological and medical sciences.

PETER FREUCHEN'S BOOK OF THE SEVEN SEAS—Peter Freuchen with David Loth—*Messner*, 512 p., illus., \$7.50 until Jan. 1; after that \$8.95. Giving the reader a fascinating touch of the beauty, romance, facts and history of the sea-

man's world. Beautifully illustrated.

PHOTOGRAPHY THROUGH THE MICROSCOPE—Eastman Kodak, 2nd ed., 72 p., illus., paper, 75 cents. How to make artistic or scientific pictures of the microscopic world.

PHYSICO-CHEMICAL EXPERIMENTS—Robert Livingston—*Macmillan*, 3rd ed., 273 p., illus., \$4.50. Selected to demonstrate the more important of the simple techniques and apparatus that the student will need to use.

THE PHYSIOLOGY OF FISHES: Volume 2, Behavior—Margaret E. Brown, Ed.—*Academic*, 526 p., illus., \$11.00. The fishes vary greatly with regard to the use they make of their various sense organs and the control they exercise over their various effectors.

THE PLANET VENUS—Patrick Moore—*Macmillan*, 132 p., illus., \$3.00. Although popular interest is focused on Mars, the beautiful planet Venus would repay close attention from the amateur astronomer as well as the professional.

PRIMARY MENTAL ABILITIES—L. L. Thurstone—*Univ. of Chicago Press*, Second impression of 1938 ed., 121 p., illus., \$3.00. New printing of a famous psychology classic.

THE SCIENCE OF SKIN AND SCUBA DIVING: Adventuring with Safety Under Water—Bernard E. Empleton, Chairman—*Association Press*, 306 p., illus., \$3.95. Prepared as a project of the Conference for National Co-operation in Aquatics, this book contains information on many aspects of skin diving with special emphasis on safety.

THE SCIENTIFIC STUDY OF SOCIAL BEHAVIOUR—Michael Argyle—*Philosophical Library*, 239 p., diagrams, \$6.00. Not intended as a textbook on social psychology, but a guide to the procedures and results in this rapidly growing field.

SOVIET EDUCATION FOR SCIENCE AND TECHNOLOGY—Alexander G. Korol—*Technology Press and Wiley*, 513 p., \$8.50. Examining the organization and effectiveness of the Soviet formal training process in terms of implications for the over-all quality of Soviet-trained scientists and engineers.

THE SPACE ENCYCLOPEDIA: A Guide to Astronomy and Space Research—M. T. Bizony, Ed.—*Dutton*, 287 p., illus., \$6.95. A timely reference work on such matters as artificial satellites, guided missiles, stars and planets.

SPACE SATELLITE: The Story of the Man-Made Moon—Lee Becland and Robert Wells—*Prentice-Hall*, 80 p., illus., by Jack Coggins, \$2.95. A book for young readers to keep them abreast of the exciting doings going on over our heads. Preface is by Dr. John P. Hagen, director of Project Vanguard.

THE STUDY OF THE SOIL IN THE FIELD—G. R. Clarke—*Oxford Univ. Press*, 4th ed., 204 p., illus., \$5.60. This edition is brought up to date and broadened to include a section on the use of air photographs for soil survey purposes.

SWAMP LIFE: An Almanac Dealing with Raccoons, Possums, Snakes, Turtles, Hell Divers, Wood Ducks, and Others Who Live in the Hollow Trees, Tangled Thickets, and Swampy Places along Little Fierzy Gizzard Creek, with a few words of advice on how to see and become acquainted with them—Glen Rounds—*Prentice-Hall*, 117 p., illus., with drawings by the author, \$3.00. A delightful book on nature near home.

TOWARD THE AUTOMATIC FACTORY: A Case Study of Men and Machines—Charles R. Walker—*Yale Univ. Press*, 232 p., illus., \$5.00. The second volume in a series reporting a study undertaken and financed by the Institute of Human Relations of Yale University.

WHITE LAND OF ADVENTURE: The Story of the Antarctic—Walter Sullivan—*Whitely House*, 224 p., maps and photographs, \$3.50. Covering the history of Antarctic exploration from early 18th century expeditions to present operations under the IGY.

Science News Letter, December 7, 1957

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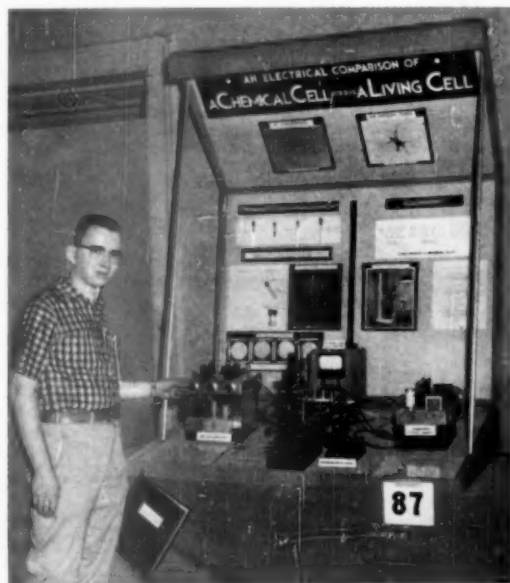


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James Barclay Compton, winner of one of the top awards in the Eighth National Science Fair, Los Angeles, May 9-11, 1957

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MEDICINE

Long Use of Some Drugs May Cause Body Damage

► PROLONGED use of some of today's common medical drugs causes permanent body damage to rats and may be doing the same thing to humans, Dr. Curt P. Richter, John-Hopkins Hospital, Baltimore, Md., reported to the National Academy of Sciences meeting in New York.

The damage done by the drugs cannot be seen and the rat appears normal. However, daily records of the animal's running activity and food and water intake over long periods of time show the permanent damage.

The drugs tested included a sulfa drug, two anti-thyroid drugs, a barbiturate, a pain-relieving drug and female hormones. They were fed to the rats for from one to four months and created great and regular cycles of activity which have never been seen in a normal rat.

Each cycle was divided into a period of activity and one of almost complete inactivity. Food intake sometimes doubled in the inactive period.

The cycles indicate damage has most likely been done to the hypothalamus in the brain, and the rat never recovers from it.

Attention should be paid to the affects of many of today's new drugs after treatment with them has stopped, rather than just while it is going on, Dr. Richter told SCIENCE SERVICE.

The studies showed that, at least in the rat, the drugs may be doing damage which does not show up at first, but which will be found long afterward.

Science News Letter, December 7, 1957

MEDICINE

Report Clue To Leukemia

► SCIENTISTS at the University of California at Los Angeles have reported a new clue to leukemia, often called "cancer of the blood."

The clue turned up in experiments with mouse leukemia, which is similar to a type of human leukemia.

Purified nucleic acid, the genetic material of all living cells and viruses, from leukemic mice was injected into a strain of mice known to have a low incidence of spontaneous leukemia.

There was a significant increase in incidence of leukemia among the mice injected with the nucleic acid.

The scientists said the leukemia-causing properties of this nucleic acid may be within this substance itself or it may in some way activate leukemia-causing potentialities in the genetic mechanism of the host.

They emphasized these results were only preliminary and that much more research was necessary to learn their true meaning.

The experiments were performed by Drs. Esther Fincher Hays, Norman Simmons and William S. Beck of the UCLA Atomic Energy Project.

Science News Letter, December 7, 1957

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Questions

ASTRONOMY—When was the first sunspot of the current cycle seen? p. 355.

ENDOCRINOLOGY—What effect did long use of reserpine have on the sex glands of experimental rats? p. 360.

OCEANOGRAPHY—What element was used in chemical studies of the ocean floor? p. 361.

Photographs: Cover, General Electric Research Laboratory; p. 355, All American Engineering Co.; p. 357, Eastman Kodak Company; p. 362, Westinghouse Electric Corporation; p. 368, Larry's Novelties.

TECHNOLOGY

Living Tissue Can Now Be Seen With Color TV

► A MICROSCOPE that uses invisible light as well as color television is giving medical science a look at living tissues of the body.

The first results with the special microscope, called the ultraviolet color translating microscope, were reported by Dr. Vladimir K. Zworykin, Radio Corporation of America, Camden, N.J., and F. Hatke and C. Berkley of the Rockefeller Institute for Medical Research to the National Academy of Sciences meeting in New York.

Up to now, studying living tissue has been difficult, if not impossible, because the light needed to illuminate the tissue under the microscope causes rapid damage and death to the cells being watched.

The TV microscope uses short bursts of ultraviolet light lasting for about one-thousandth of a second. Sixty such bursts per second are used to illuminate the specimen and can be kept up for longer "viewing" times than have been possible in the past. The image seen by the microscope is reproduced on a color television receiver.

Earlier methods of watching live tissue required photography or the use of a continuous beam of ultraviolet light.

The reduced ultraviolet "dose" from the new system has allowed researchers to make continuous observations of cell cultures, muscle fibers, and connective tissue. Color motion pictures have also been made of various body cells as well as the capillary circulation between arteries and veins, all in the living state.

Science News Letter, December 7, 1957

Do You Know?

Parthenogenesis is far less marked in chickens than in turkeys.

Chemicals may be used to cause flowers to set their fruit without pollination.

The first International Polar Year was 1882-83.

Galileo's sunspot drawings made in 1612 are comparable in quality with drawings made today with small modern telescopes.

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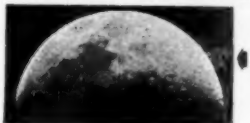
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❁ **PONY-TAIL MAKER** for youngsters or grown-ups applies a tight rubber band around a lock of hair at any desired point up to one inch from the scalp. Made of plastic, the device is in the form of a collar with two small, opposite slots and a flange. It can also be used for pigtailed, braids or buns.

Science News Letter, December 7, 1957

❁ **BURGLAR ALARM** is modeled on the principles of the proximity fuse. It is described as needing no broken beams, cut wires or shattered windows to wail its alarm. The portable unit can be set so the alarm stays on as long as someone is near it, or sound off for two minutes and then stop, or continuously.

Science News Letter, December 7, 1957

❁ **ELECTRONIC SOLDERING GUN** weighs only 19 ounces and is less than two inches in diameter through its housing. It delivers full 100 watts, heats in two to three seconds on 110-120 volts A.C. 60 cycle and cools quickly. It also features a built-in spotlight and interchangeable tips.

Science News Letter, December 7, 1957

❁ **TELEPHONE ASHTRAY**, shown in the photograph, fits both regular and more



modern French telephones. It is designed to provide an ashtray for conversationalists caught without one. Easily slipped on and off for emptying and cleaning, the telephone caddy is made of a heavy, burnished and lacquered brass.

Science News Letter, December 7, 1957

❁ **ALUMINUM MAILBOX** loads from the top and releases mail from the bottom. The main body of the box is made of a single, seamless aluminum extrusion with

fluted sides. The face plate, available in color, is a grid-rolled patterned sheet. The bottom of the box is spring-hinged for easy opening.

Science News Letter, December 7, 1957

❁ **SHOE SHINE PADS** are made of circular cotton pieces saturated with a polishing agent. Disposable, the quick shine pads provide a water-repellent finish, as well as protection against mold and mildew.

Science News Letter, December 7, 1957

❁ **ALL-PLASTIC SCRUB BRUSH** is said to be resistant to swelling and warping so that bristles remain firmly set. Molded in one piece, the block has a hole for hanging and corrugations for good gripping. The bristles are made of a styrene monofilament resistant to matting. The brush weighs five ounces.

Science News Letter, December 7, 1957

❁ **SLIDE RULE-TIE CLASP** measures two inches in length. The slide rule is fully calibrated and has A, C, and D scales. Available in sterling silver or in gold-plate, the rule can be clipped to a pocket if not used as a tie clasp.

Science News Letter, December 7, 1957



Nature Ramblings



By HORACE LOFTIN

➤ **THE BEAR** cub was plump, almost rolling in fat, and the cold wind seemed to make him long for sleep. Yet he paused for a final slash at the rotten log in hopes of finding just one more insect.

The hunt was short-lived, however, for his mother gave a peremptory growl which sent him hurrying after her.

They moved on until they reached a shallow cave hidden by thick underbrush. The mother entered first, nosed around to see that all was well, then settled heavily to the earth. The cub clambered in after her, snuggled against her warm body. Shortly both were in a deep sleep. This sleep would last for three months, while snow and ice reigned outside the little cave.

The cub was now not quite a year old. He had been born the previous January in this cave, or one quite like it. He had no brothers or sisters, though the usual litter

Winter Sleep



is two or three. He now weighed more than 50 pounds, including the thick layer of fat that would nourish him through the winter sleep, but he was only 10 ounces at birth and hardly larger than a red squirrel!

During the remaining months of his first winter, the mother bear had kept the helpless cub covered with her body. His eyes did not open until he was six weeks old. But in another few weeks, the cub was a strong and active bundle of curiosity, ready

to emerge from the cave into the world of the forest.

It had been an exciting summer for the cub. His mother kept him well fed and out of serious trouble. She was a stern teacher in the ways of the woods. Inattention was punished by a heavy blow from her paw. All in all, though, it was fun.

Now back for the winter sleep again! He leaned against his mother as the wind whistled outside. Perhaps he was dreaming of another summer of cubdom under the loving, watchful eye of his mother. If this was his thought, he would be greatly disappointed next spring.

For next year he will be a cub no longer in the eyes of his mother. Soon after they emerge from the winter sleep, she will chase him off, and he must seek his own fortune.

She, for her part, will find another mate, a father for the cubs she will have the following winter. And perhaps the cub, no longer a cub, will find a mate, too.

Science News Letter, December 7, 1957